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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,648	04/04/2001	Joseph Wytman	003481.P009D	9902

8791 7590 08/20/2003

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EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/825,648

Applicant(s)

WYTMAN, JOSEPH

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Comments

1. The objection to the title has been overcome by Applicant's amendment.
2. The objection to the abstract has been overcome by Applicant's amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. No. 5,853,559) in view of Getchel et al. (U.S. Pat. No. 6,019,164).

Tamaki et al. disclose a method for processing semiconductor wafer substrates **6** by placing the wafer **6** on a flat base **9** and engaging the wafer **6** to the bottom of an electrolyte tank **1** (fig. 1; col. 4, lines 1-55). The electrolyte tank **1** has a tank body **8** with sleeve-like sidewalls and a seal **11** that contacts the edges of the wafer **6** forming an enclosed tank for containing the electrolyte solution (fig. 1). When the wafer **6** is in position for processing, the wafer **6** forms the floor of the tank, and the wafer **6** is then electroplated (fig. 1; col. 4, lines 1-55).

The method of Tamaki et al. differs from the instant invention because Tamaki et al. do not disclose the following:

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- a. The wafer chuck having a base and an upper body in which the upper body is coupled to the base by a flexible coupling, and that tilting of the wafer allows for a compliant engagement of the wafer and the sleeve, as recited in claim 17; and
- b. Raising at least one lift pin through the upper body to raise the wafer for removal of the wafer from the upper body, as recited in claim 18.

Regarding claims 17 and 18, Getchel et al. disclose a workpiece chuck for holding a semiconductor wafer, wherein the workpiece chuck has an upper support on which the wafer is mounted and a lower support which is mounted onto a base for supporting the chuck (col. 3, lines 38-63). The upper and lower supports are held together by a non-constraining attachment means, such as springs, which allows substantially continuous relative movement between layers of the chuck (col. 3, lines 38-63). The non-constraining attachment means allow the position of the wafer to be maintained throughout operation. Getchel et al. also teach the use of lift pins **710** that allows the wafer to be lifted off of the top surface of the chuck (col. 19, lines 26-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Tamaki et al. to use a chuck capable of continuous relative movement between the layers of the chuck as taught by Getchel et al. because using a chuck capable of movement between the layers allows the wafer to be maintained in a constant position. The seal **11** of Tamaki et al. and the chuck of Getchel et al., capable of continuous movement, would prevent or reduce leakage of the processing fluid.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Tamaki et al. to use lift pins to remove the wafer as taught by Getchel et al. because using lift pins simplifies the removal of the wafer by ejecting the wafer from the surface of the support.

5. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. No. 5,853,559) in view of Getchel et al. (U.S. Pat. No. 6,019,164), as applied above to claims 17 and 18, and further in view of admissions of prior art made in the present disclosure.

Tamaki et al. and Getchel et al. describe a processing method having the limitations recited in claims 17 and 18 of the instant invention, as explained above in section 5.

The method described by Tamaki et al. and Getchel et al. differs from the instant invention because they do not disclose the following:

- a. Using the processing fluid to deposit copper material onto the wafer, as recited in claim 19; and
- b. Using the processing fluid to remove copper material from the wafer, as recited in claim 20.

The instant disclosure states, "The technique of electroplating and electropolishing materials, such as copper, are known in the art" (see page 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Tamaki et al. and

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Getchel et al. to use the processing fluid to deposit or remove copper because the instant disclosure states that such techniques are known in the art. It is further noted that Tamaki et al. disclose the process of electroplating, and it is also known that electroplating and electropolishing can be performed using the same apparatus by switching the connection of the electrodes at the power source.

Response to Arguments

6. Applicant's arguments filed July 28, 2003, have been fully considered but they are not persuasive.

7. Regarding the comments presented by the Examiner in the Office action mailed May 5, 2003, Applicant has cited several cases regarding the definition of claim limitations with respect to other claims (see page 3 of Applicant's response). The statements made in the prior Office action defined the limitations with respect to Applicant's disclosure, not the dependent claims. According to the MPEP §2106, Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Furthermore, Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims. *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (*en banc*), *aff'd*, U.S. , 116 S. Ct. 1384 (1996). Therefore, the Examiner has defined the phrase "processing the wafer utilizing the process fluid" with respect to Applicant's disclosure, which states:

It is appreciated that the chamber 40 can be utilized for holding a variety of processing fluids. However, the chamber of the preferred embodiment utilizes a liquid electrolyte for electroplating (depositing) or electropolishing (removing) metal, including copper material, onto/from the wafer 35. (See page 13, lines 5-8 of the instant disclosure.)

While it is agreed that the chamber can be utilized to hold a variety of processing fluids, the disclosure does not specify such fluids or provide any further definition of what those liquids might be. Additionally, it is noted that the claims relate to "A method of processing a wafer", not a chamber capable of being utilized for holding a variety of processing fluids. Therefore, in order to determine what the Applicant's regard as "processing", the disclosure must be used to define the scope and meaning of the term. Since the disclosure does not provide any additional processing methods other than "electroplating (depositing) or electropolishing (removing) metal", the definition of the term "processing" in those terms appears reasonable and justified. It is further noted that the apparatus disclosed is equipped to perform such electrolytic processes identified above by virtue of the anode **45** and cathode electrode **47** shown in Figures 4-8. The apparatus as disclosed is not capable of performing other processes using processing fluids such as chemical vapor deposition (CVD), including plasma enhanced CVD, or physical vapor deposition (PVD).

8. Regarding the rejection of claims 17-20, Applicant has argued "the addition of Getchel fails to teach or suggest the upper body coupled to the base by a flexible

coupling that allows the upper body to tilt relative to the base" (see page 3 of Applicant's response). This argument is not persuasive because Getchel et al. clearly disclose, "The chuck also includes non-constraining attachment means which holds the lower support and the base together and holds the lower support and the base together while allowing substantially continuous relative movement between layers of the chuck caused by thermal expansion forces due to differential temperature effects between the upper support, lower support and the base" (see US '164 col. 3, lines 47-54). The non-constraining attachment means can include "vacuum or springs or spring washers" (col. 3, lines 54-60), which include flexible couplings. The chuck described by Getchel et al. would be capable of tilting because the upper support and the lower support are attached by these non-constrained attachment means. The Examiner also wishes to repeat the statement made in the prior Office action that the claim does not positively recite tilting the wafer during the processing of the wafer; the claim merely recites that the chuck is allowed, or capable, of tilting. Since the chuck of Getchel et al. is formed of two non-constrained parts, the Examiner maintains the position that such a chuck is capable of tilting.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within


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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
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blm
August 13, 2003